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MAR 29 2007

Application No.: 10/565,994

Docket No.: JCLA19238

REMARKS**BEST AVAILABLE COPY**Present Status of the Application

Claims 1-6 are rejected. Specifically, claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Semura (U. S. Patent 5,696,860) in view of Kondo (JP 2002-162211). In addition, claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Semura in view of Kondo. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Semura in view of Kondo and further in view of Seike (U. S. Patent 5,367,591). Applicants have amended independent claim 1 and dependent claim 3 to improve clarity. After entry of amendments, claims 1-6 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Claim Rejections under 35 USC 103

Claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Semura in view of Kondo. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Semura in view of Kondo. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Semura in view of Kondo and further in view of Seike. Applicants respectfully traverse the rejections for at least the reasons set forth below.

1. As previous state, with respect to independent claim 1, the present invention, as for example shown in FIGs. 1-3, basically includes the following features. Each of the fixing pieces 3 has a sensor holding groove 3b at a bottom surface of the fixing piece, and a tube receiving portion 3a protruded from one side of the fixing piece, which communicates with the sensor holding groove 3b. *A tube 2 enclosing the fiber bragg grating sensor S is disposed*

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*between the pair of fixing pieces 3, such that both ends of the tube 2 are detachably secured to each of the tube receiving portions 3a of the fixing pieces 3 by a fastening member 4. It should be further noted that the tube 2 is detachably secured to the tube receiving portion 3a. In other words, the tube 2 is not adhered and fixed on the surface of the object to be measured.*

Remarkably, the tube 2 carrying the sensor is detachably secured to tube receiving portion 3a by the fastening member 4. The fastening member 4 can prevent external pressure from being imposed on FBG sensor by coupling a pair of fixing pieces 3 integrally when being moved or kept in typical circumstances. The fastening member 4 can also keep the initial value fixed when being manufactured. The fastening member 4 protects the FBG sensor from environmental factors when the pressure on the tube 2 is released after installation out in the field.

Further, due to the fixing piece 3 with the tube receiving portion 3a being coupled integrally as a solid structure, it improves the convenience in keeping and managing the sensor. The FBG sensor can be secured to the fixer by external forces. Further, the protective case is not necessary when being handled and it is easy to be manipulated by a non-expert.

Ideally, due to the fastening member 4, it allows to set a desired tension of the FBG sensor during manufacturing and to maintain the tension while being moved or kept. This results in a simple installation on an object to be measured without an additional adjustment.

With respect to claim 3, the present invention recites the thread fastening mechanism, which fastens from the side surface of the tube. The thread hole penetrates the sidewall of the fastening member and the fastening bolt fixes the tube through the thread hole from the side surface of the tube. Claim 3 has been amended with improved clarity.

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2. In re Semura (see Fig. 2), in addition to the previous arguments, the optical device is to branch the input signal by 1 x 4 -branch optical waveguide 12, which is formed on the substrate 10. The waveguide is different from FBG to measure the strain of the object to be measured. In more comparison, the single bare fiber 16a is connected to four bare fibers 20a by the waveguide 12, which is formed on the substrate 10. Apparently, the fixing piece 22 (26) and 30 (32) do not have the tube receiving portion 3a associating with the fastening member 4, as recited in independent claim 1.

Further, as shown in FIG. 3, the substrate 10 with the waveguide 12 is un-detachably fixed to the pieces 22 and 30 by the adhesive 42 (col. 3, lines 60-63). This structure does not disclose the present invention.

In other words, Semura is in different mechanism and is nonanalogous to the present invention to measure the strain of the object to be measured. Semura further failed to disclose the features of the present invention about the tube to protect the FBG. And the tube 2 is easily affixed to the fixing pieces 3 and is not directly fixed to a surface of the object to be measured.

3. In re Kondo, the Office Action additionally cites Kondo in combination to provide the tube. However, Applicants respectfully disagree.

It should be noted that the protection tube 10 is adhered and fixed on the surface of the object S (Abstract).

Further as shown in FIG. 18 of Kondo, the protection tube 10 is indeed adhered and fixed on the surface of the object S to be measured. The screw part (fasten member) 16 is provided at both ends of the tube 10 but not from the side. The transmission fiber 12 is thereby

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connected to the sensor 11 by screwing tight from the end but not from the side.

4. In other words, with respect to claim 3 (see Fig. 2), the threaded hole 3d is formed on an upper portion of the tube receiving portion 3a, and a fastening member 4 is threadedly engaged with the threaded hole 3d for selectively compressing and fastening the tube 2. In Kondo, the screw part 16 is fixed at both ends of the tube 10 but not from the side. Kondo does not disclose the features recited in claim 3.

5. With respect to claim 5, the fixing piece 3 is detachably secured to the fixing plate 7 of the object by a fastening member 5. However, in Kondo, the protection tube 10 is indeed adhered and fixed on the surface of the object S to be measured while the screw part 16 is fixed at both ends of the tube 10 but not from the side.

The present invention allows the user to easily install the FBG sensor just by fixing it to the fixing plate 7 of an object to be measured, and releasing the fastening member 4 afterward.

6. With respect to claim 6, Seike is further cited in combination. However, claim 6 is depending on claim 1. Seike does not provide the missing features of Semura in claim 1 as discussed above. Therefore, even if Seike in combination with Semura is made, the features recited in claim 6 is not disclosed by prior art.

For at least the foregoing reasons, Applicant respectfully submits that independent claim 1 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-6 patently define over the prior art references as well.

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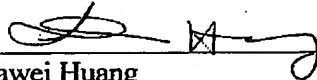
CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-6 of the invention patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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4 Venture, Suite 250  
Irvine, CA 92618  
Tel.: (949) 660-0761  
Fax: (949)-660-0809

Respectfully submitted,  
J.C. PATENTS

  
Jiawei Huang  
Registration No. 43,330

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